

### REMARKS

Reconsideration and allowance are respectfully requested.

Claims 1-6 are pending.

Claims 2-4 stand rejected under 35 USC § 112, second paragraph.

Claim 2 has been amended to clarify the required ratio. In view of this, it is respectfully requested that the rejection under § 112 be withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Mizutani et al. (US Pat. 5878066A).

Regarding claim 1, the Examiner stated that "Mizutani et al. discloses an optical semiconductor apparatus driving method therefor light source apparatus and optical communication system using the same in Figure 10A comprising of an absorber layer (1019,1020), upper and lower clad layers (1023,1041) formed on upper and lower portions of the absorption layer (1019, 1020), respectively; and electrode (1033,1037) for applying an electric field to the absorption layer, wherein the absorption layer is constructed by combination of two quantum wells (1019,1020) with having a width different from each other (Figure 10A shows layer 1019

and 1020 having different width)(col. 15, lines 40-45; col.16, lines 10-15)."

Applicant respectfully disagrees with the Examiner's statement. The quantum well structure of Mizutani doesn't have two quantum wells having a width different from each other. Although two index regulating layers 1019 and 1020 are disclosed at col.16, lines 10-16 of Mizutani, the widths (thicknesses) of the quantum wells in the two index regulating layers are the same (4nm), as are the barrier thicknesses in the two index regulating layers (10nm). It is the number of quantum well layer/barrier layer pairs (seven for index regulating layer 1019 vs. eight for index regulating layer 1020), and not the widths of the quantum well layers, that distinguish the two index regulating layers:

Each of the index regulating layers 1019 and 1020 having a strained quantum well structure consists of seven (the layer 1019) or eight (the layer 1020) pairs of intrinsic (i-) In<sub>0.53</sub>Ga<sub>0.47</sub> As well layers (thickness: 4 nm) and i-InGaAsP barrier layers (thickness: 10 nm, and composition wavelength: 1.15 μm) and a pair of intrinsic InGaAsP SCH layers (thickness: 24 nm, and composition wavelength: 1.15 μm). (col. 16, lines 10-16, emphasis added)

Therefore, Mizutani does not disclose or suggest two quantum wells having a width different from each other, as required in claim 1.

Moreover, amended claim 1 includes the further requirement of a "vertical combination of at least two quantum wells having a width different from each other ". This further distinguishes over Mizutani, because the two index regulating layers 1019 and 1020 of Mizutani are separate respective regions disposed laterally of one another (see Fig. 10a), and not in a vertical combination. These layers in Mizutani that include quantum wells function as index regulating layers, while the quantum wells of the claimed invention function as absorption layers. The absorption layer of an electro-absorption optical modulator, formed by the claimed quantum wells, allows linearity of the optical modulator to be enhanced.

In view of the above, it is believed that Mizutani does not anticipate or render obvious the invention of claim 1 and it is respectfully requested that the rejection of claims 1 and 2 in view of Mizutani be withdrawn.

Claims 1, 5 and 6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kashima et al. (US Pat. 6,008,066A).

Regarding claim 1, the Examiner stated that "Kashima discloses that ... absorption layer (13) is constructed by combination of two quantum wells (13a, 13c) with having a

width different from each other (Figure 1 shows layer 13a and 13c having different width) (col.7, lines 18-20)"

However, Kashima doesn't disclose or suggest a "vertical combination of at least two quantum wells having a width different from each other" as required by amended claim 1. As can be seen in Fig. 1, the regions 13a and 13c are disposed laterally of one another, not in a vertical combination. Further, layer 13a of Kashima is a light-emitting layer and layer 13c of Kashima is a light-absorbing layer (see col. 4, lines 25-30), whereas the at least two quantum wells of claim 1 are light absorption layers. When the vertical combination of at least two quantum wells having a width different from each other, as required in claim 1, is applied to an electro-absorption optical modulator, it enhances the linearity of the optical modulator.

In view of the above, it is believed that Kashima does not anticipate or render obvious the invention of claim 1 and it is respectfully requested that the rejection of claims 1, 5 and 6 in view of Kashima be withdrawn.

In view of the above, it is believed that the subject application is in condition for Allowance and such a Notice is respectfully requested. If anything else is needed to place the

application in condition for allowance, the Examiner is respectfully requested to contact the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Yoon S. Ham', is written over a horizontal line.

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